INSTALLATION INSTRUCTION 88558

Rev F

For Rancho Suspension System **RS6558B**: HUMMER H3

READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION

IMPORTANT NOTES!

WARNING: This suspension system will enhance the off-road performance of your vehicle. It will handle differently, both on and off-road, from a factory equipped passenger car or truck. Extreme care must be used to prevent loss of control or vehicle rollover during abrupt maneuvers. Failure to drive this vehicle safely may result in serious injury or death to the driver and passengers. ALWAYS WEAR your seat belts, REDUCE your speed, and AVOID sharp turns and other abrupt maneuvers.

A. Before installing this system, have the vehicle's alignment and frame checked by a certified technician. The alignment must be within factory specifications and the frame of the vehicle must be sound (no cracks, damage or corrosion).

B. Do not install a body lift kit with this suspension system or interchange Rancho components with parts from another manufacturer. Use the appropriate Rancho shock absorbers.

C. Do not powdercoat or plate any of the components in this system. To change the appearance of components, automotive paint can be applied over the original coating.

D. Each hardware kit in this system contains fasteners of high strength and specific size. Do not mix hardware kits or substitute a fastener of lesser strength. See bolt identification table on page 2.

E. Compare the contents of this system with the parts list in these instructions. If any parts are missing, contact the Rancho Technical Department at 1-734-384-7804.

F. Install all nuts and bolts with a flat washer. When both SAE (small OD) and USS (large OD) washers are used in a fastener assembly, place the USS washer against the slotted hole and the SAE washer against the round hole.

G. Apply a drop of thread locking compound to all bolts during installation. CAUTION: Thread locking compound may irritate sensitive skin. Read warning label on container before use.

H. Unless otherwise specified, tighten all nuts and bolts to the standard torque specifications shown in the table on page 2. USE A TORQUE WRENCH for accurate measurements.

I. Some of the service procedures require the use of special tools designed for specific procedures. The following tools and supplies are recommended for proper installation of this system: ☑

- ☐ Hummer H3 Service Manual
- ☐ Universal Steering Linkage Puller J24319
- ☐ Ball Joint Separator J43631
- ☐ Die Grinder
- ☐ Drill motor
- ☐ Assorted Drills: 1/8" through 1/2"
- ☐ Torque Wrench (250 FT-LB capacity)
- ☐ 1/2" Drive Ratchet and Sockets
- ☐ Assorted Combination Wrenches
- ☐ Heavy Duty Jack Stands
- ☐ Wheel Chocks (wooden blocks)
- ☐ Hydraulic Floor Jack
- ☐ Center punch
- ☐ File
- ☐ Reciprocating Saw (to modify skid plate)
- ☐ Hammer
- ☐ Wire Brush (to clean bracket mounting surfaces)
- ☐ Black Enamel Paint
- ☐ Silicone Spray Lubricant
- ☐ Tape Measure
- ☐ Safety Glasses (wear safety glasses at all times)

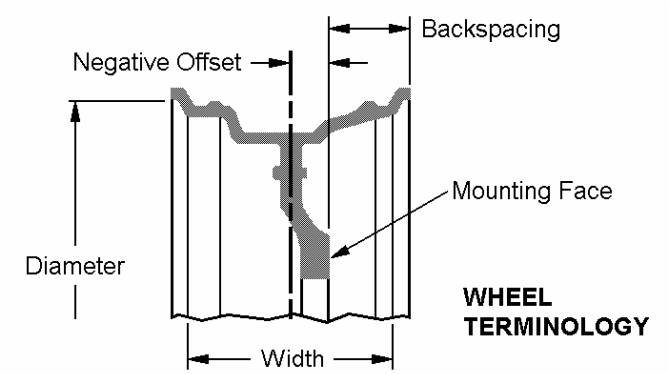
J. It is extremely important to replace torsion bars, CV flanges, and front drive shaft/pinion relationships as original. Be sure to mark left/right, front/rear, and indexing of mating parts before disassembly. A paint marker or light colored nail polish is handy for this.

K. Suspension components that use rubber or urethane bushings should be tightened with the vehicle at normal ride height. This will prevent premature failure of the bushing and maintain ride comfort.

L. Welding on a car creates an electrical charge throughout the body and frame. Disconnect the vehicle's battery prior to any welding. Place welding ground clamps as near as possible to the weld. Never use a vehicle suspension component as a welding ground point.

M. The required installation time for this system is approximately 4 to 5 hours. Check off the box (☑) at the beginning of each step when you finish it. Then when you stop during the installation, it will be easier to find where you need to continue from.

N. The recommended tire size for this suspension system is 35" x 12.5". The maximum wheel backspacing is 5 inches on 20" wheels and 4.5 inches on 16", 17" and 18" wheels. For 37" tires, trimming the fender is required. Before installing any other combination, consult your local tire and wheel specialist.

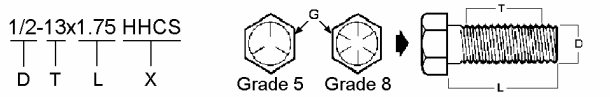


O. Important information for the end user is contained in the consumer/installer information pack. If you are installing this system for someone else, place the information pack on the driver's seat. Please include the installation instructions when you finish.

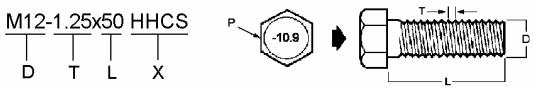
P. Thank you for purchasing the best suspension system available. For the best-installed system, follow these instructions. If you do not have the tools or are unsure of your abilities, have this system installed by a certified technician. RANCHO SUSPENSION IS NOT RESPONSIBLE FOR DAMAGE OR FAILURE RESULTING FROM AN IMPROPER OR MODIFIED INSTALLATION...

STANDARD BOLT TORQUE SPECIFICATIONS

INCH SYSTEM			METRIC SYSTEM			
Bolt Size	Grade 5	Grade 8	Bolt Size	Class 9.8	Class 10.9	Class 12.9
5/16	15 FT-LB	20 FT-LB	M6	5 FT-LB	9 FT-LB	12 FT-LB
3/8	30 FT-LB	35 FT-LB	M8	18 FT-LB	23 FT-LB	27 FT-LB
7/16	45 FT-LB	60 FT-LB	M10	32 FT-LB	45 FT-LB	50 FT-LB
1/2	65 FT-LB	90 FT-LB	M12	55 FT-LB	75 FT-LB	90 FT-LB
9/16	95 FT-LB	130 FT-LB	M14	85 FT-LB	120 FT-LB	145 FT-LB
5/8	135 FT-LB	175 FT-LB	M16	130 FT-LB	165 FT-LB	210 FT-LB
3/4	185 FT-LB	280 FT-LB	M18	170 FT-LB	240 FT-LB	290 FT-LB



G = Grade Marking (bolt strength)
D = Nominal Diameter (inches)
T = Thread Pitch (threads per inch)
L = Length (inches)
X = Description (hex head cap screw)



P = Property Class (bolt strength)
D = Nominal Diameter (millimeters)
T = Thread Pitch (thread width, mm)
L = Length (millimeters)
X = Description (hex head cap screw)

PARTS LIST

P/N	DESCRIPTION	QTY.
	Box 1 of 4	
176088B	Sway Bar End Link	4
176340	Brake Line Extension Bracket	1
176346B	Front Crossmember	1
176347B	Rear Crossmember	1
176348	Differential Drop Bracket	2
176349	Bump Stop Bracket	2
176352	Torsion Bar Relocator, Right	1
176353	Torsion Bar Relocator, Left	1
176354B	Aft Brace	2
176355	Bump Stop Nut Bracket	2
176356B	Skid Plate	1
176357	Aft Brace Bracket	2
176358	Rear Bump Stop	2
860521	Aft Brace Bushing Kit	1
520041	Bushing	8
420042	Sleeve	4
860479	Front Differential Bushing Kit	1
520039-1	Upper Bushing, Front Differential	1
520039-2	Lower Bushing, Front Differential	1
520039-3	Sleeve	1
860528	Aft Brace Kit	1
420061	Sleeve	2
	M12-1.75 x 80 HHCS	2
	M12-1.75 Stover Nut	2
	12mm Washer	2
	USS Washer	2
	Thread Lock	2
860529	Crossmember Hardware Kit	1
	M16-2.00 x 120 HHCS	2
	M16-2.00 Nut	2
	16mm Washer	4
	M10-1.25 x 30 HHCS	2
	7/16 USS Washer	2
	M10-1.25 x 35 HHCS	5
	10mm Washer	9

P/N	DESCRIPTION	QTY.
	10mm Lock Washer	7
	M14-2.00 x 40 HHCS	2
	14mm Washer	4
	M14-2.00 Stover Nut	2
	M10-1.50 x 90 HHCS	2
	Large Retainer Washer	2
	1/2 Rubber Washer	8
860530	Sway Bar End Link Hardware Kit	1
545	Bushing	8
P01013	Sleeve	8
	M12-1.75 x 65 HHCS	8
	M12-1.75 Stover Nut	8
	12mm Washer	8
	7/16 USS Washer	8
860531	Rear Hardware Kit	1
	M8-1.25 x 20 HHCS	1
	M8-1.25 Nyloc Nut	1
	8mm Washer	2
	1/2-13 x 4.0 HHCS	4
	1/2-13 Nut	4
	1/2 SAE Washer	8
	M10-1.50 x 30 HHCS	2
	M10-1.50 Nyloc Nut	2
	10mm Washer	4
94180	Information Pack	1
780281	Rancho Decal	1
88558	Instruction	1
94119	Consumer/Warranty Information	1
94177	Warning Sticker	1
	Box 2 of 4	
176350	Knuckle, Left	1
176351	Knuckle, Right	1
	Box 3 of 4	
44058	Rear Leaf Spring With Shim	1
	Box 4 of 4	
44058	Rear Leaf Spring With Shim	1

FRONT SUSPENSION

VEHICLE PREPARATION & TORSION BAR REMOVAL

1) ☐ Park the vehicle on a level surface. Set the parking brake and chock rear wheels. Measure and record the distance from the center of each wheel to the top of the fender opening. See illustration 1.

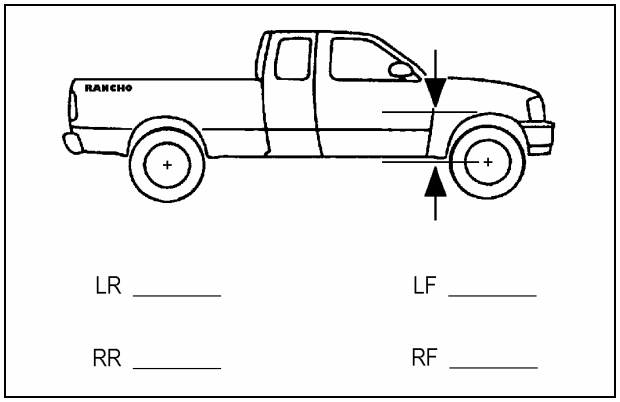


Illustration 1

2) ☐ Raise the front of the vehicle and support the frame with jackstands. Remove the front wheels and set them aside.

3) ☐ Remove the front skid plates.

4) ☐ Mark the torsion bars left and right. Make alignment marks on the torsion bars, the lower control arms, and the adjustment arms.

5) ☐ Measure and record the length of adjuster bolt threads above the adjuster nut.

6) ☐ Remove the adjuster bolt, spacer and adjuster nut. See illustration 2.

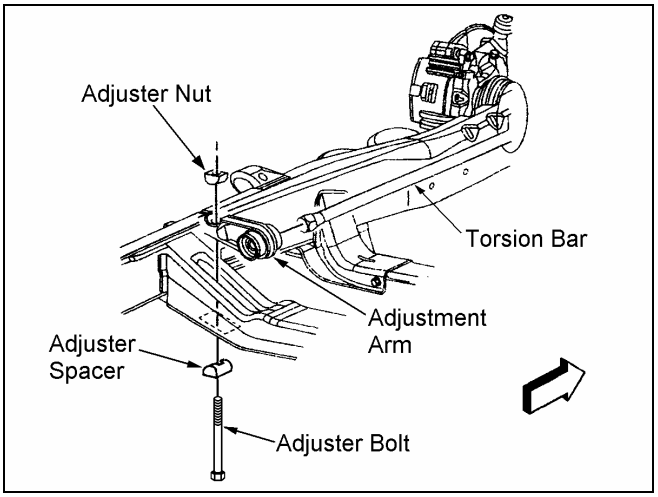


Illustration 2

7) ☐ Disengage the torsion bar from the lower control arm. Remove the adjustment arm and torsion bar.

8) ☐ Repeat steps 5 through 7 for the other side.

BUMP STOP, END LINK & SHOCK ABSORBER REMOVAL

1) ☐ Remove the bump stop from the frame bracket as shown in illustration 3.

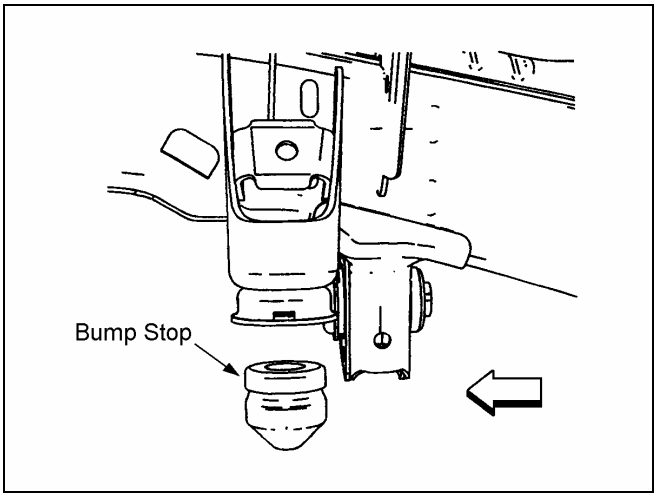


Illustration 3

2) ☐ Support the lower control arm with a jack.

3) Disconnect the ABS plug inside the fender at the frame connection. Separate the line from the upper control arm and steering knuckle. See illustration 4.

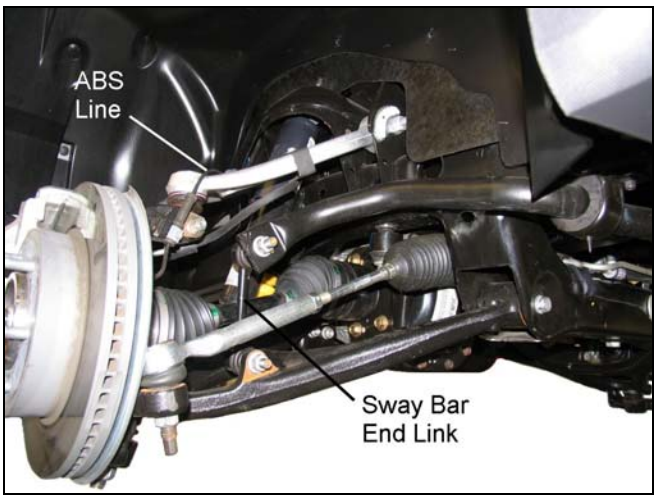


Illustration 4

4) ☐ Remove the sway bar end link.

5) ☐ Remove the shock absorber upper mounting nut and insulator.

6) ☐ Remove shock absorber lower mounting bolt. Remove shock absorber.

7) ☐ Repeat steps 1 through 6 for the other side.

STEERING KNUCKLE & LOWER CONTROL ARM REMOVAL

1) ☐ Support the lower control arm.

2) ☐ Separate the brake hose from the upper control arm.

3) ☐ Remove the brake caliper and its mounting bracket as an assembly. Hang the caliper assembly with wire or a tie wrap.

4) ☐ Label the brake rotor left or right. Remove the brake rotor. Remove the axle hub nut.

5) ☐ Remove the nut from the outer tie rod stud. Disconnect the tie rod end from the steering knuckle with a universal puller.

6) ☐ Remove the nut from the lower ball joint stud. Separate the ball joint from the lower control arm.

7) ☐ Remove the nut and bolt from the upper ball joint. Remove the steering knuckle and hub assembly.

8) ☐ Remove the lower control arm pivot bolts. Remove the lower control arm.

9) ☐ Repeat steps 1 through 7 for the other side.

FRONT DIFFERENTIAL RELOCATION

1) ☐ Disconnect the vent hose. Support the front differential assembly with adjustable stands.

2) ☐ Remove the front differential rear mounting bolt.

3) ☐ Remove the four bolts attaching the front differential rear crossmember to the frame. Remove the crossmember. See illustration 5.

4) ☐ Reference mark the front driveshaft to the front differential yoke. Remove the yoke retainer bolts and retainers.

5) ☐ Disconnect the driveshaft from the differential. Wrap bearing caps with tape and **support** the shaft.

CAUTION: Lowering the driveshaft to far may damage the CV boot. See illustration 19.

6) ☐ Remove the front differential assembly forward mounting bolts. **Carefully** lower the differential about 4 inches.

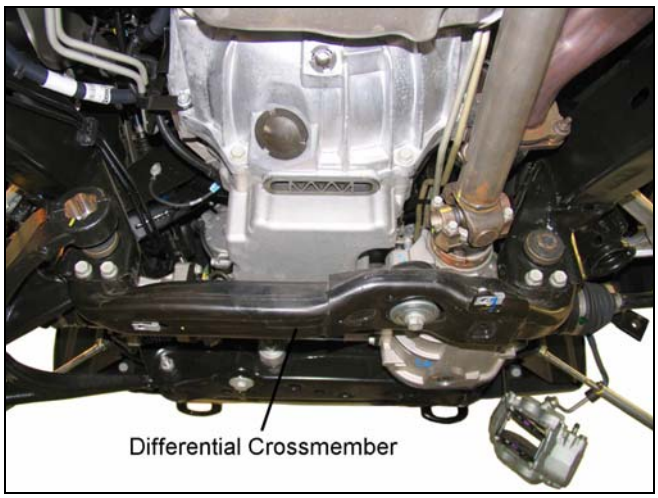


Illustration 5

7) ☐ Attach drop bracket 176348 to the passenger side frame and front differential assembly as shown in illustration 6. Use the original bolt and the 14mm hardware from kit 860529.

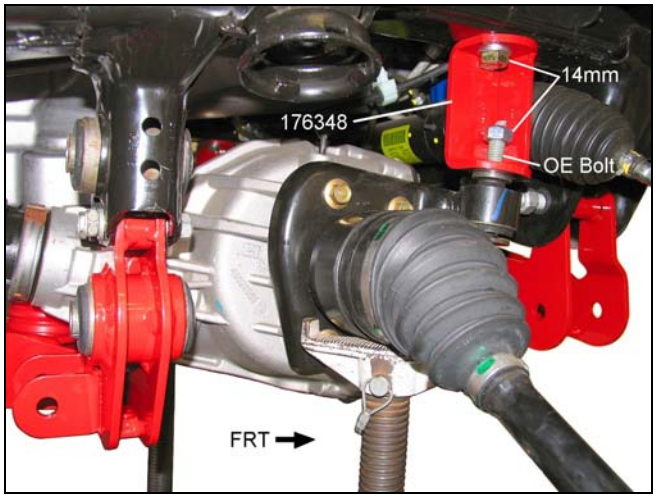


Illustration 6

8) ☐ Attach drop bracket 176348 to the driver side frame and front differential assembly as shown in illustration 7. Use the original bolt and the 14mm hardware from kit 860529.

NOTE: Drop bracket 176348 must be installed with the angled end attached to the differential bracket and the welded gusset toward the front of the vehicle.

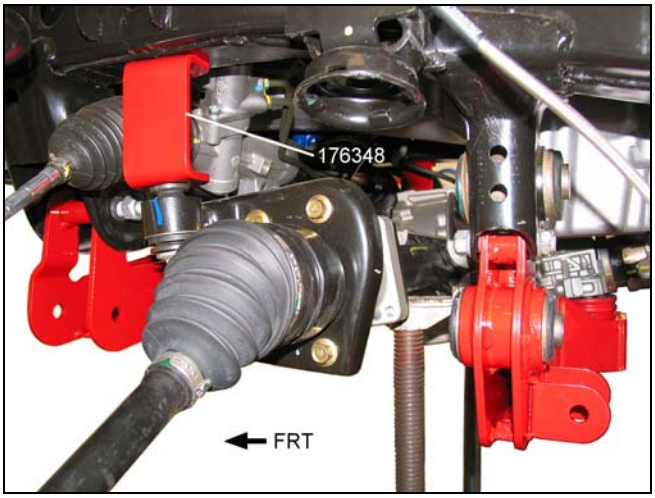


Illustration 7

9) ☐ Tighten the differential mounting bolts to 114 ft. lbs.

10) ☐ Align reference marks and reattach the front diveshaft. Tighten the yoke retainer bolts to 19 ft. lbs.

CROSSMEMBER INSTALLATION

1) ☐ Insert large upper bushing 520039-1 into the differential mounting hole of crossmember 176347B. Place the large washer from kit 860529 on top of bushing. See illustration 8.

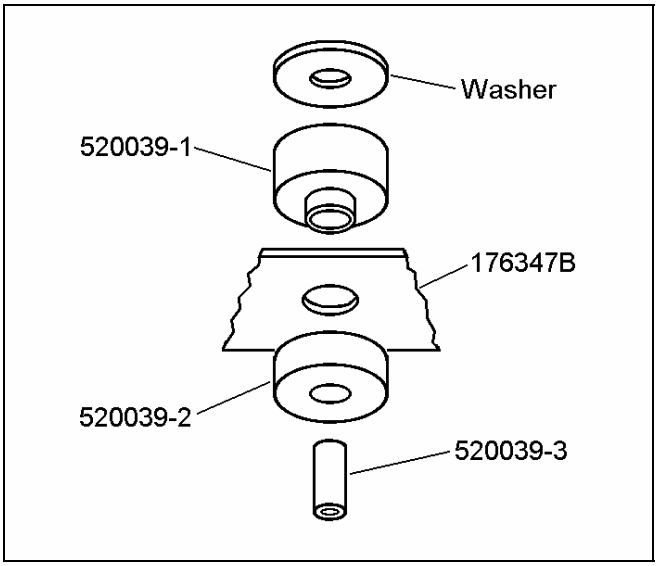


Illustration 8

2) ☐ Loosely attach crossmember 176347B to the frame brackets with the original hardware and 10mm hardware from kit 860529. Use the shorter 10mm bolt with a lock washer and USS washer installed. See illustration 9.

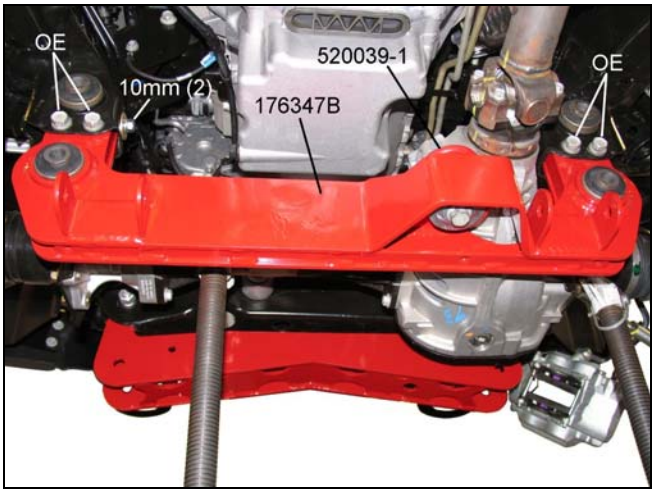


Illustration 9

3) ☐ Place lower bushing 520039-2 under the crossmember bracket and insert sleeve 520039-3 into the bushings. Loosely attach the rear of the differential assembly to crossmember 176347B with the original hardware.

4) ☐ **Push up the crossmember assembly**. Tighten the 10mm bolts evenly to 40 ft. lbs and the original frame mounting bolts to 45 ft. lbs. Tighten the differential rear mounting bolt to 55 ft. lbs.

5) ☐ To provide clearance for front crossmember 176346B, file the corners in both lower control arm front mounts. See illustration 10. Remove sharp edges and paint exposed metal.

Illustration 10

6) ☐ Attach front crossmember 176348B to the lower control arm front mounts with the original hardware. See illustration 11. Tighten the bolts to 122 ft. lbs.

Illustration 11

BUMP STOP BRACKET INSTALLATION

1) ☐ Enlarge the hole in the bottom of the original bump stop frame bracket to 13/32".

2) ☐ Attach bump stop bracket 176349 to the bottom of the original frame bracket with the 10 mm hardware from kit 860529 and nut bracket 176355. See illustration 12.

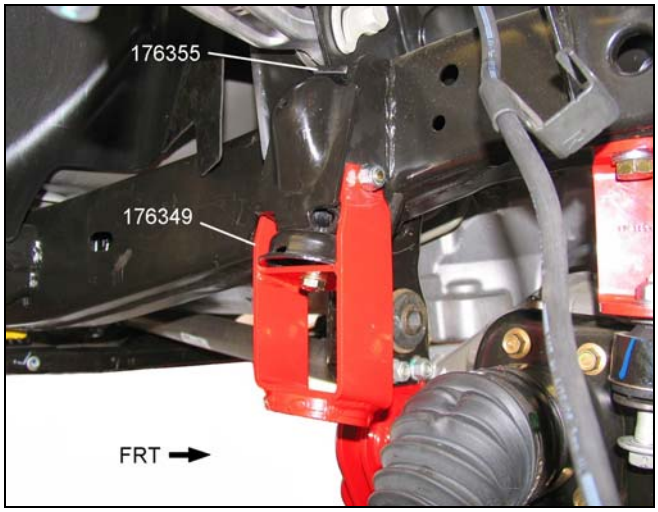


Illustration 12

3) ☐ Using bracket 176349 as a template, mark the front and back mounting hole locations on the frame bracket. Drill a 13/32" hole at each location.

4) ☐ Install the 10 mm hardware from kit 860529. Tighten nuts and bolts to 32 ft. lbs.

5) ☐ Insert original bump stop into bracket 176349.

6) ☐ Repeat steps 1 through 5 for the other side.

LOWER CONTROL ARM & STEERING KNUCKLE INSTALLATION

1) ☐ Loosely attach the passenger side lower control arm to the front crossmember with the 16mm hardware from kit 860529 and to the rear crossmember with the original bolt. See illustration 13.

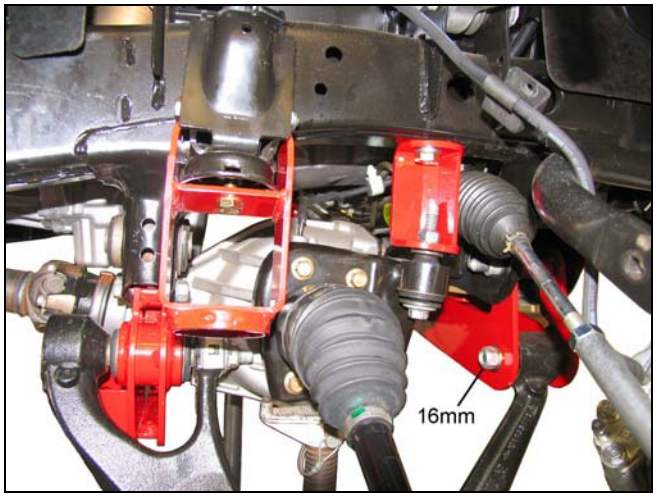


Illustration 13

2) Support the passenger side lower control arm with a jack stand.

3) ☐ Remove the hub and bearing assembly from the original passenger side steering knuckle.

4) ☐ Apply thread lock to original bolts and attach the hub and bearing assembly to right steering knuckle 176351. See illustration 14. Tighten the bolts to 133 ft. lbs.

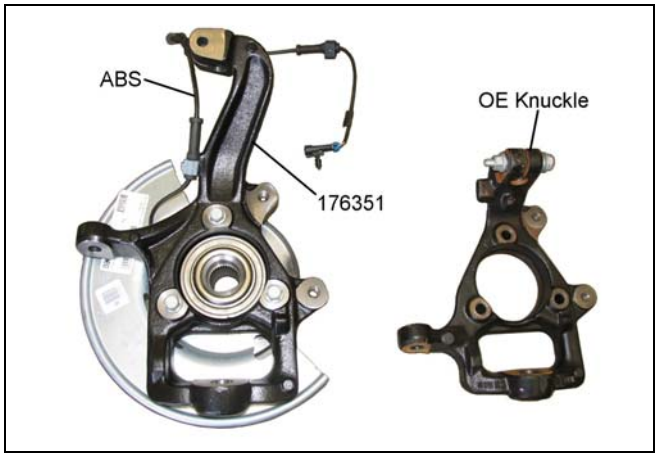


Illustration 14

5) ☐ Install the knuckle assembly on the axle shaft and upper and lower ball joints. Attach the ball joints to the knuckle with the original hardware. See illustration 15.

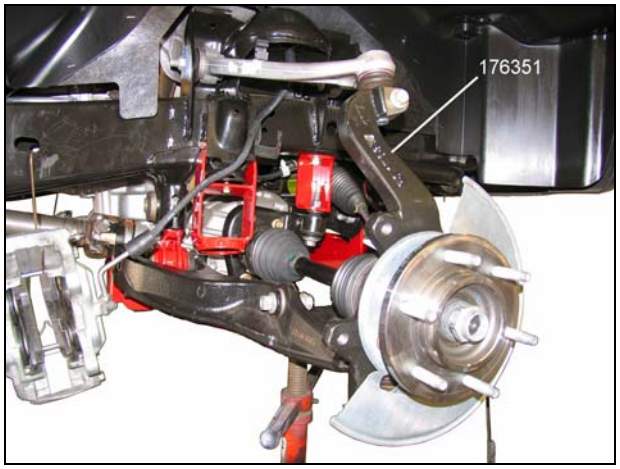


Illustration 15

6) Attach tie rod end to knuckle with the original nut. Tighten nut to 44 ft. lbs.

7) ☐ Tighten the lower ball joint nut to 96 ft. lbs. Tighten the upper ball joint nut and bolt to 51 ft. lbs.

8) ☐ Apply thread lock and install the axle hub nut. Tighten the nut to 191 ft. lbs.

9) ☐ Install the brake rotor. Reattach the front caliper with the original mounting bolts. Be sure to clean the bolt threads and apply thread lock. Tighten the caliper mounting bolts to 129 ft. lbs.

10) ☐ Set the spindle to fender height at 26.5 inches. Tighten the lower control arm rear bolt to 133 ft. lbs. Tighten the lower control arm front bolt to 122 ft. lbs.

11) ☐ Repeat steps 1 through 10 to install the lower control arm and left steering knuckle 176350 on the driver side.

SHOCK ABSORBER & END LINK INSTALLATION

1) ☐ Support the lower control arm.

2) ☐ Install washer and bushing on new Rancho shock absorber. Insert shock stud through upper mounting hole. Place lower mount over hole in lower control arm bracket.

3) ☐ Attach lower mount with the original hardware. Tighten the lower bolt to 59 ft. lbs. Install bushing washer and nut on shock stud. Tighten the upper nut to 22 ft. lbs.

4) ☐ Apply silicone lubricant and press two bushings and sleeves (from kit 860530) into sway bar end link 176088B. See illustration 16.

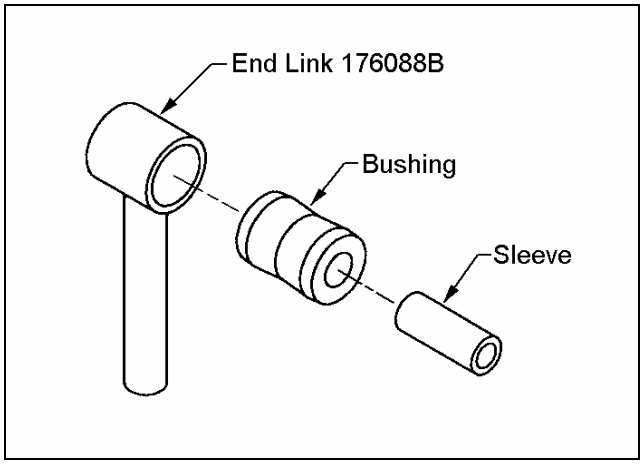


Illustration 16

5) ☐ Attach end link 176088B to the sway bar and lower control arm with the hardware from kit 860530. Use the larger washer against the bushing and install the original nuts. Tighten nuts and bolts to 48 ft. lbs.

6) ☐ Attach the brake hose bracket to the bottom of the upper control arm with the original bolt. Use silicone spray to slide bracket on hose. Align edge of bracket with upper control arm. See illustration 17.

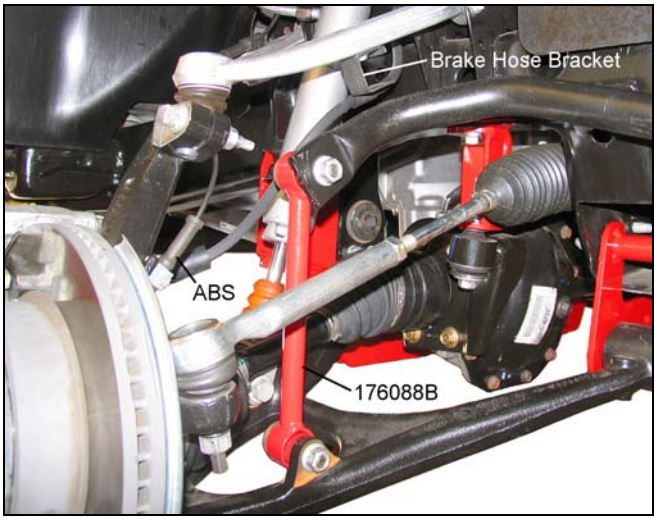


Illustration 17

7) ☐ Reattach ABS line. Use silicone spray to slide clip insulators.

8) ☐ Repeat steps 1 through 7 for the other side.

AFT BRACE INSTALLATION & CV BOOT ADJUSTMENT

1) ☐ Lubricate two bushings and one sleeve (from kit 860125) with a silicone spray. Press the bushings and sleeve into aft brace 176354B. See illustration 18.

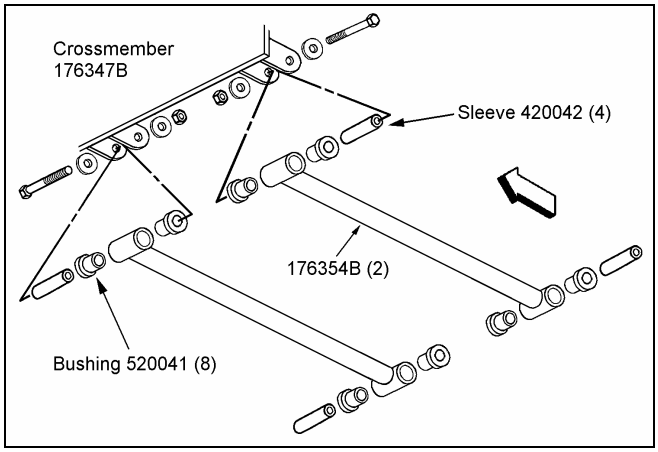


Illustration 18

2) ☐ Repeat step 1 to install the rest of the bushings and sleeves.

3) ☐ Loosely attach the aft braces to crossmember 176347B with the hardware from kit 860529.

4) ☐ Remove the transfer case skid plate.

5) ☐ Using a large screwdriver, **CAREFULLY** slide the CV boot on the front driveshaft 1/4" back toward the transfer case. See illustration 19. Rotate the driveshaft to slide the boot evenly.

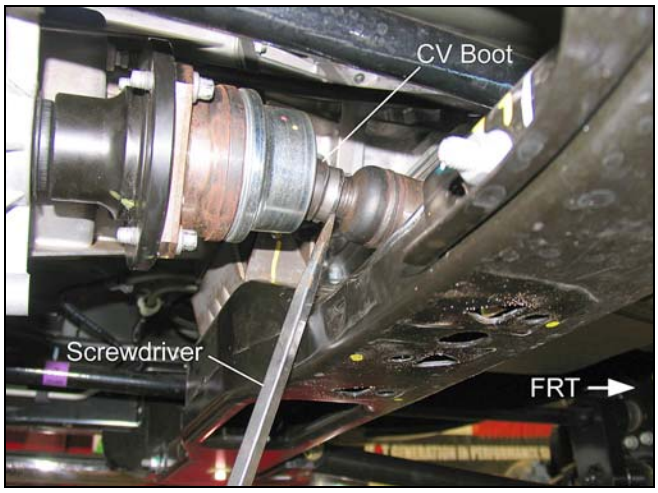


Illustration 19

CAUTION: An improperly adjusted boot will reduce the service life of the boot. Do not damage the CV boot.

6) ☐ Cut off the right front corner of the transfer case skid plate as shown in illustration 20. Drill a 17/32" hole at the location indicated.

7) ☐ Insert sleeve 420061 into existing hole in transmission crossmember. Reinstall transfer case skid plate.

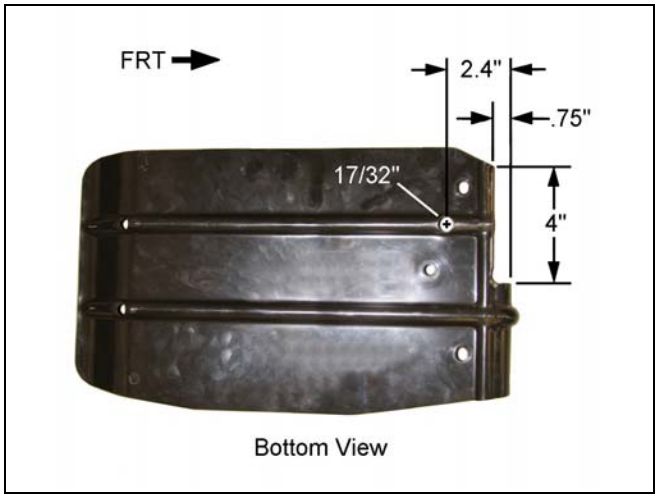


Illustration 20

8) ☐ Loosely attach aft brace bracket 176357 on top of the transmission crossmember above the transfer case skid plate. Use the hardware from kit 860528. See illustration 21.

9) ☐ Loosely attach aft brace bracket 176357 to the top of transmission crossmember on the driver side. Use sleeve 420061 and the hardware from kit 860528. See illustration 21.

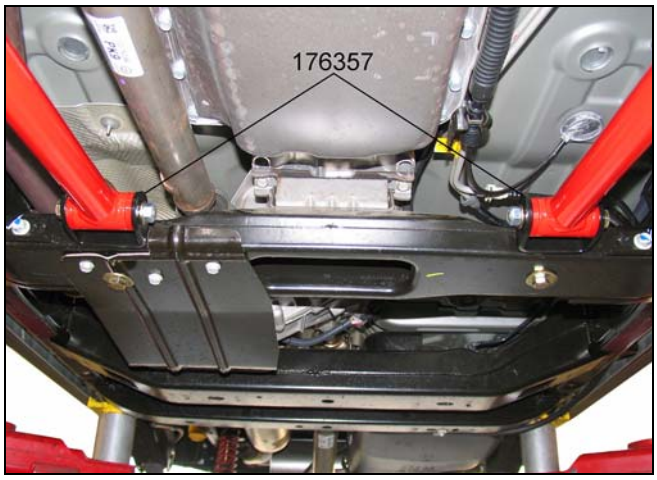


Illustration 21

10) ☐ Attach aft braces to brackets with the hardware from kit 860529. Tighten the bracket to crossmember bolts then the aft brace bolts to 45 ft. lbs.

TORSION BAR INSTALLATION

1) ☐ Fully insert left torsion bar relocator 176353 into the driver side lower control arm. See illustration 22.

NOTE: When installing the relocator, align the hex opening as close to the original bushing as possible.

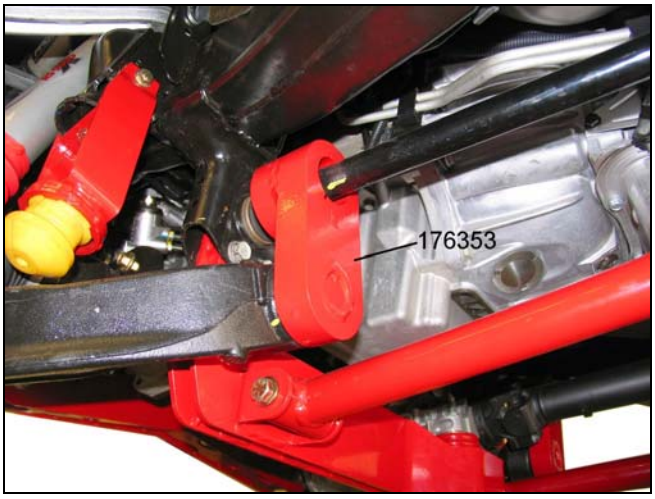


Illustration 22

2) ☐ Align mark on left torsion bar with mark on lower control arm. Insert torsion bar into left relocator.

3) ☐ Align marks and install torsion bar arm. Refer back to illustration 2.

4) ☐ Install the adjuster bolt, spacer and adjuster nut. Tighten the adjuster bolt to its original height.

5) ☐ Repeat steps 1 through 4 to install right torsion bar relocator 176352 on the passenger side.

SKID PLATE INSTALLATION

1) ☐ Attach skid plate 176356B to the front and rear crossmembers. Use the rubber washers and 10mm hardware from kit 860529. See illustration 23. Install two rubber washers for each of the rear bolts.

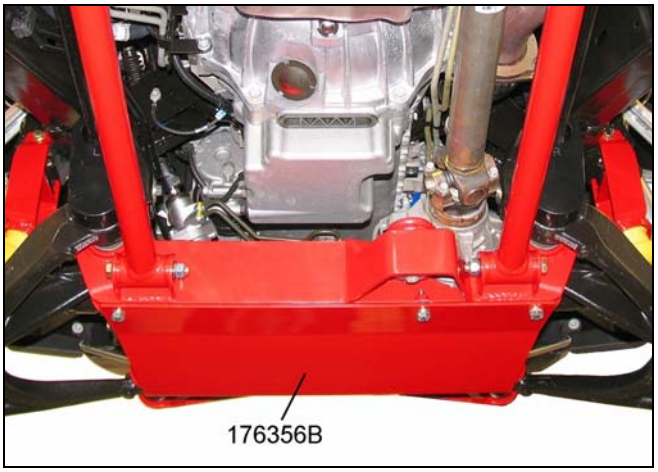


Illustration 23

2) ☐ Tighten the front skid plate bolts then the rear.

3) ☐ Modify the original front skid plate as shown in illustration 24.

Note: Modifying the front width to 1.25 inches on each side may be required.

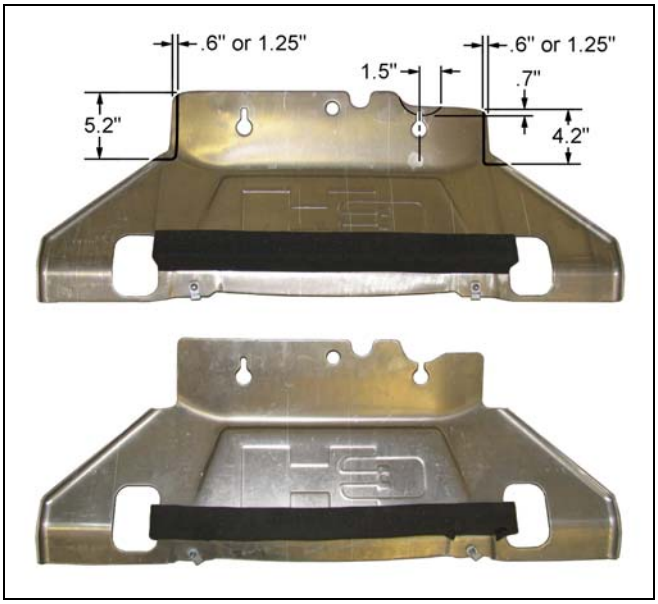


Illustration 24

4) ☐ Attach the skid plate with the original hardware.

5) ☐ Install front wheels and lower vehicle to ground. Tighten the lug nuts to 103 ft. lbs.

REAR SUSPENSION

END LINK & SHOCK ABSORBER REMOVAL

1) ☐ Chock front wheels. Raise the rear of the vehicle and support the frame with jack stands. Remove the rear wheels.

2) ☐ Support the rear axle assembly with a floor jack.

CAUTION: Do not allow the axle to hang by any hoses or cables.

3) ☐ Disconnect the rear differential vent hose from the frame.

4) ☐ Remove the sway bar end link nuts from the ball studs. Remove the end link. See illustration 25.

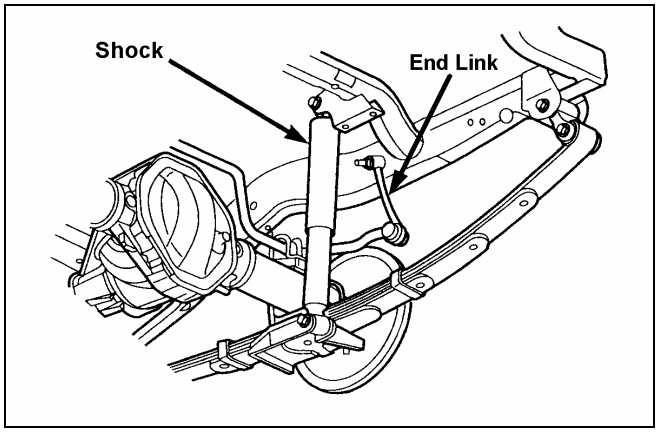


Illustration 25

5) ☐ Remove the shock absorber upper and lower mounting bolts. Remove the shock absorber.

6) ☐ Repeat steps 4 and 5 for the other side.

BRAKE LINE BRACKET INSTALLATION

1) ☐ Separate the brake line bracket from the rear differential bracket. See illustration 26.

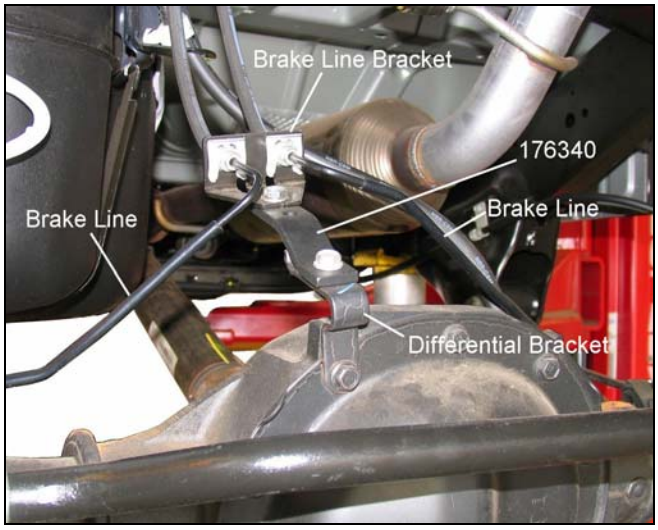


Illustration 26

2) ☐ Attach brake line extension bracket 176340 to the rear differential bracket as shown in illustration 26. Use the 8mm hardware from kit 860531.

3) ☐ Carefully reshape the brake lines and attach the original brake line bracket to extension bracket 176340 with the original hardware. See illustration 26.

LEAF SPRING & BUMP STOP BRACKET INSTALLATION

1) ☐ Separate the ABS cable from the frame.

2) ☐ Remove the nuts, U-bolts and spring plate from the axle. See illustration 27.

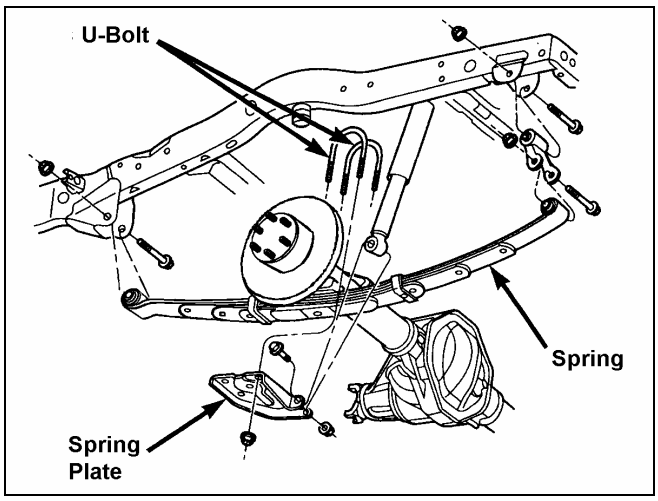


Illustration 27

3) ☐ Support the leaf spring. Loosen the upper shackle bolt and remove the nuts and bolts from the front and rear spring eyes. Remove the spring.

4) ☐ Loosely attach new leaf spring 44058 to the front frame bracket and rear shackle with the original hardware.

5) ☐ Align center bolt with locating hole and lower the axle onto the spring. Make sure the large end of the shim faces the front of the vehicle. See illustration 28.

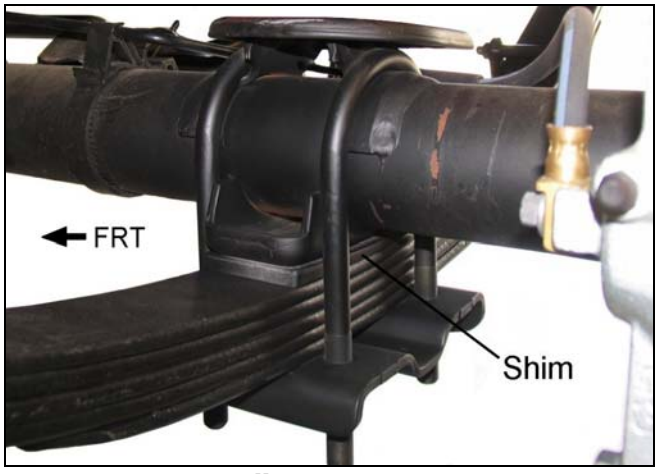


Illustration 28

6) ☐ Install the U-bolts, spring plate and nuts. Tighten the U-bolt nuts evenly to 60 ft. lbs.

7) ☐ Using the existing hole, attach bump stop bracket 176358 to the axle pad with the 10mm hardware from kit 860531. See illustration 29.

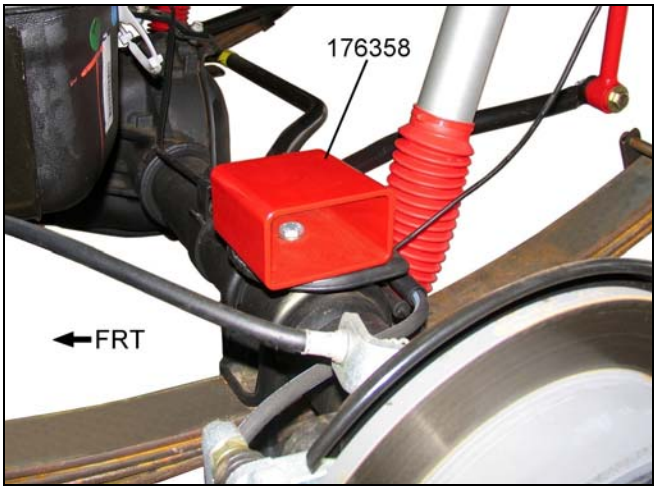


Illustration 29

8) ☐ Repeat steps 1 through 7 for the other side.

SWAY BAR END LINK & SHOCK ABSORBER INSTALLATION

1) ☐ Apply silicone lubricant and press two bushings and sleeves (from kit 860530) into sway bar end link 176088B. See illustration 30.

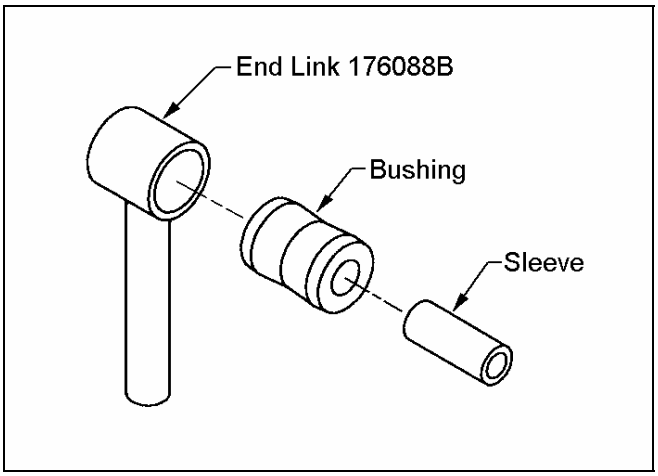


Illustration 30

2) ☐ Attach the end link assembly to the frame bracket and sway bar with the hardware from kit 860530. Use the larger washer against the bushing and reuse the original nuts. See illustration 31.

3) ☐ Repeat steps 1 and 2 for the other side.

4) ☐ Install new Rancho Shock absorbers. Use the original hardware.

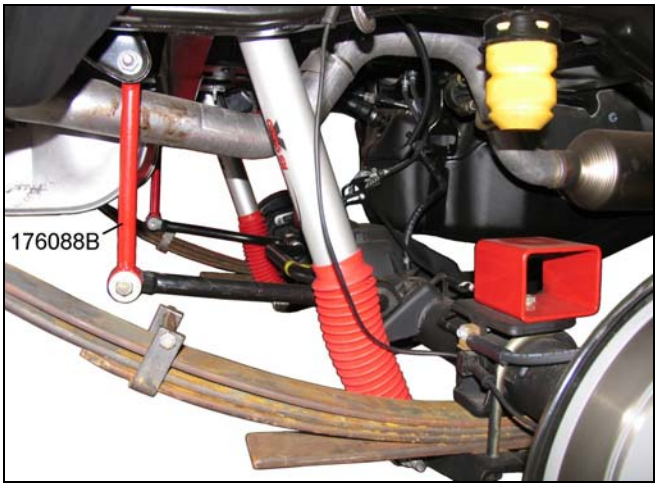


Illustration 31

5) ☐ Install rear wheels and lower vehicle to ground. Tighten lug nuts to 103 ft. lbs.

6) ☐ Tighten the leaf spring and shackle bolts to 70 ft. lbs. and the end link bolts to 59 ft. lbs. Tighten the shock absorber upper bolts to 26 ft. lbs. and the lower bolts to 70 ft. lbs.

FINAL CHECKS & ADJUSTMENTS

1) ☐ Jounce suspension and move the vehicle to normalize ride height. Verify that the front spindle to fender height is 26" to 26.5" and that both sides are equal. If necessary, adjust the tension on the torsion bars to correct the height.

NOTE: The front bump stop should slightly contact the lower control arm at normal ride height.

2) ☐ Turn the front wheels completely left then right. Verify adequate tire, wheel, and brake hose clearance. Inspect steering and suspension for tightness and proper operation.

3) ☐ Readjust headlamps. Have vehicle aligned at a certified alignment facility.

Recommended Alignment Specifications
Caster (degrees): 3.5° ± 1.0°
Camber (degrees): 0° - .3°
Sum Toe In (degrees): .1° ± .2°

Please retain this publication for future reference. See Important Note O.